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2014/2015 Winter Outlook: Sufficient Power Supplies Expected, but Natural Gas Pipeline Constraints an Ongoing Concern

Winter Reliability Program in place to help maintain grid reliability

Holyoke, MA—November 20, 2014—The New England region should have sufficient resources in place this winter to meet consumer demand for electricity, according to ISO New England Inc., the operator of the region's bulk power system and wholesale electricity markets. However, insufficient pipeline capacity to meet power generators' demand for natural gas continues to be a particular concern during the winter months. To address potential fuel-availability issues and to help protect system reliability during the cold winter weeks, ISO New England has for a second year developed a Winter Reliability Program (WRP).

"The 2013/2014 Winter Reliability Program was critical in keeping the lights on during last winter's cold temperatures," said Vamsi Chadalavada, executive vice president and chief operating officer of ISO New England Inc. "Yet even with that program, system operators' ability to maintain a reliable supply of power was challenged as a result of the limited supply of natural gas coming into New England to serve natural gas power plants. Because of the retirement of several large non-natural-gas-fired generators since last winter, as well as the possibility of pipeline constraints, the ISO and stakeholders implemented another winter program to increase the fuel availability for oil- and natural-gas-fired power plants. If this winter is the same or colder than last winter, having generators with oil on site or a committed source of liquefied natural gas will help improve power system operations."

2014/2015 Winter Summary

Winter forecast for consumer demand and capacity

ISO New England's winter forecast predicts that at normal winter temperatures of about 7 degrees Fahrenheit (°F), peak demand would be about 21,085 megawatts (MW). If extreme winter weather of 2°F occurs, demand could reach 21,835 MW.* Both forecasts take into account reductions in electricity demand from regionwide energy-efficiency (EE) efforts. Without about 1,490 MW in lower demand from EE, acquired through the region's Forward Capacity Market (FCM), the forecast for peak demand during normal winter weather would be 22,575 MW, and the peak demand forecast for extreme winter weather conditions would be 23,325 MW.*

Last winter, system operators relied on several generators that will not be available for all or part of this winter. These include Salem Harbor Station, which on May 31, 2014, retired its two remaining coal and oil units totaling about 585 MW, and Vermont Yankee Nuclear station, which will retire its 615 MW of capacity by the end of 2014. Other generators, including the 350 MW oil-fired Norwalk Harbor Station, the 125 MW coal-fired Mt. Tom Station, and a unit totaling 150 MW at the Bridgeport Harbor Station are no longer providing power to the grid.

Generation totaling about 29,835 MW has an obligation through the FCM to be available this winter; however, a generator's maximum possible output may be greater than its capacity supply obligation. When possible, generators typically offer the additional power they can generate, above their obligation, into the electric energy market, particularly when consumer demand for electricity is peaking. If all the region's power plants were available and operating at maximum output, the total amount of electricity produced would be approximately 32,445 MW. Nevertheless, on winter days when natural gas pipelines have operated at full capacity, not enough gas has been available to serve all of New England's natural-gas-fired power plants. In fact, while gas-fired resources together

represent more than 11,000 MW of generating capacity, ISO New England's operational experience has shown that during cold periods, the pipelines are capable of supporting less than half this amount.

Through the FCM, the region has also procured about 810 MW of electricity imports from neighboring power systems and more than 600 MW of demand-response resources that can be called on to reduce electricity use during tight system conditions.

Winter Reliability Program

The Winter Reliability Program will run from December 1, 2014, to February 28, 2015, to address concerns about the ability of resources to perform when dispatched, especially during cold weather conditions. The program provides incentives for oil and dual-fuel generators (i.e., units that can run on either gas or oil) to increase oil inventories, for natural-gas-fired generators to contract for liquefied natural gas (LNG) to augment pipeline gas, and for new demand-response resources to be available. Resources submitted to the ISO their intent to participate in the voluntary program by October 1. Final results of this year's program participation will not be available until after December 1, but preliminary results indicate that 81 oil and dual-fuel units have committed to store more than 4 million barrels of oil; eight gas-fired units have contracted for about 900,000 million British thermal units of LNG; and three new demand-response assets will be able to provide demand reductions of 14 MW.

Another component of the WRP that will help bolster reliability beyond this winter is the incentive for gas-fired generators to invest in dual-fuel capability. So far, six units with a combined capacity of 1,775 MW have submitted their intent to become dual-fuel capable this year or next. The submission deadline is December 1, 2014. Pending successful testing to ensure these resources can run on oil, units representing about 1,000 MW of capacity plan to add dual-fuel capability this winter.

Additional enhancements needed to maintain short- and long-term reliability

In addition to the WRP, operational and wholesale market changes have been or are being made to improve grid reliability in time for winter:

- **Improved information sharing:** As a result of Federal Energy Regulatory Commission (FERC) Order 787, power system and natural gas pipeline operators can now share more detailed operational information about their respective system conditions to protect the integrity of both the natural gas system and power grid.
- **Energy Market Offer Flexibility:** On December 3, significant enhancements to the energy market are scheduled to take effect. Generators will be able to submit power supply offers that vary by hour—instead of offering one static price for the operating day—and will also be able to update their offers in real time to reflect changes in the real-time price of fuel. The changes will result in more accurate prices and improve resources' incentives to follow the ISO's dispatch instructions.
- **Increased scarcity pricing:** Also beginning on December 3, higher caps on scarcity pricing will go into effect. This will result in more accurate pricing in the energy market during scarcity conditions, when the power grid is deficient in the resources needed to maintain reliability.

The ISO has made longer-term changes to the wholesale market design that will create strong incentives for generators to firm up their fuel supply and improve their overall performance, but those changes will not go into effect until 2018. In the meantime, FERC has directed ISO New England to work with stakeholders to determine an appropriate interim solution to address winter power grid reliability concerns associated with pipeline constraints. Further, ISO New England has informed regional stakeholders that power system reliability will continue to be threatened until the region invests in sufficient infrastructure to either resolve the pipeline constraints, or sufficiently offset the need for natural gas through investment in other fuels or energy sources.

Natural Gas Dependency Challenges Increase in the Winter

New England's dependence on natural gas puts the region in a vulnerable position, especially during cold weather, because the current pipeline infrastructure cannot deliver all the gas required to serve both heating customers and power generators. Most gas-fired generators do not have firm contracts for natural gas delivery and instead rely on the release of spare pipeline capacity from gas utilities. With increased residential and business conversions to natural gas for heating, spare pipeline capacity is often not available for power plants.

Last winter, periods of sustained cold weather boosted demand for natural gas, causing severe pipeline constraints that led to record-high natural gas prices. As a result, for much of winter 2013/2014, natural gas was often more expensive than oil, which is relatively uncommon. Because oil-fired generation was more competitively priced than the natural-gas-fired generation on many days, the oil fleet ran at higher-than-normal capacity through much of the winter; coal-fired generators also ran more often than usual. Most significantly, on certain cold days, the natural gas pipelines in New England were running at maximum capacity, but very few gas-fired generators were producing power, signaling that the gas was being used for other purposes, most likely to heat homes and businesses.

The cost of wholesale electricity is largely based on the cost of fuel, and with record-high natural gas prices, wholesale power prices also hit record highs last winter. As a result, from December 2013 through February 2014, the total value of the wholesale energy market was about \$5.05 billion. By comparison, the value of the market in 2012—the year with the lowest average wholesale power prices since 2003—was \$5.2 billion for the entire 12 months.

With the retirement of coal, oil, and nuclear power plants, the region's reliance on natural gas to produce electricity is expected to increase. Relying less on generators that have on-site fuel storage, such as nuclear, coal or oil, and more on generators with a "just-in-time" fuel-delivery system, such as natural gas, means that the availability of gas supply in the region directly affects the reliability of the power grid.

Operational Procedures to Maintain Reliability

In planning for the winter season, ISO New England takes into account a number of outage scenarios, including the potential for some natural gas generators to be temporarily unavailable during cold or extreme winter conditions. Should unexpected generator or transmission line outages occur, the ISO has procedures in place to maintain reliability, including calling on demand-response resources to reduce their energy use, importing emergency power from neighboring regions, and asking businesses and residents to voluntarily conserve electricity.

Last winter, demand for electricity peaked at 21,453 MW on December 17, 2013. The all-time winter peak of 22,818 MW was set on January 15, 2004, during a sustained cold snap. The highest demand ever recorded in New England was 28,130 MW, on August 2, 2006.

*Updated on November 24, 2014

ABOUT ISO NEW ENGLAND

Created in 1997, ISO New England is the independent, not-for-profit corporation responsible for the reliable operation of New England's electric power generation and transmission system, overseeing and ensuring the fair administration of the region's wholesale electricity markets, and managing comprehensive regional electric power planning.

